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Factors Underlying Male and Female Use of Violent Video Games

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Author note

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video games, gender, violence, media choice, selective exposure, media use, emotions, guilt, enjoyment, moral disengagement

Abstract

Research has consistently shown that males play violent video games more frequently than females, but factors underlying this gender gap have not been examined to date. The present approach examines the assumption that males play violent video games more, because they anticipate more enjoyment and less guilt from engaging in virtual violence than females. This may be because males are less empathetic, tend to morally justify physical violence more, and have a greater need for sensation and aggression in video game play than females. Results of a path model based on survey data of 444 respondents and using multi-step multiple mediation analyses confirm these assumptions. Taken together, the findings of the present study shed further light on the gender gap in violent video game use.

Introduction

Male users play violent video games more frequently than female users and, overall, spend considerably more time playing violent video games than female users (e.g., Hartmann and Klimmt, 2006a; Jones et al., 2006; Lemmens et al., 2006; Lucas and Sherry, 2004; Lin, 2010; Möller and Krahé, 2009). But what factors explain this gender gap in violent video game use?

Substantial literature exists on the *effects* of violent video game play (Anderson et al., 2010), and a couple of studies have already examined factors underlying gender differences in *general* video game usage (Funk and Buchman, 1996; Hartmann and Klimmt, 2006a; Lucas and Sherry, 2004). However, research explaining the use of *violent* video games is relatively scarce (e.g., Chory and Goodboy, 2011; Hopf et al., 2008). Particularly, few authors have provided reasons for the gender difference in violent video game use (e.g., Jansz, 2005; Rosaen et al., 2006). In contrast, a substantial body of research exists on the preference of violence displayed in non-interactive media like movies (Goldstein, 1998; Hoffner and Levine, 2005; Krcmar and Greene, 1999; Krcmar and Kean, 2004; Tamborini, 2003; Weaver, 2011), including gender-specific explanations (see for overviews Goldstein, 1998, 1999; Hoffner and Levine, 2005).

Drawing on this body of literature, the present approach seeks to shed further light on the factors underlying the gender difference in violent video game use. More specifically, the present approach suggests that gender differences in attraction to violent video games are linked to differing *anticipatory emotions* (Baumeister et al., 2007) associated with violent game play that result from differences in personality characteristics between men and women.

The Gender Gap in Violent Video Game Use

Physical violence appears to be a "male thing" (Archer and Côté, 2005). Males engage more frequently in real physical violence than females (Archer, 2004a), find more pleasure in physical violence (Elbert et al., 2010), and prefer media violence in different non-interactive media

outlets more than females (Kirsh, 2012; Weaver, 2011). They also prefer *virtual violence* more, defined as "any user behavior intended to do harm to perceived social agents [in a video game] who apparently try to avoid the harm-doing" (Hartmann, 2011: 34).[1] Consequently, males play violent video games more often than females (Funk et al., 2000; Lucas and Sherry, 2004).

What factors may be related to this gender difference? Several factors have been suggested in the past in the context of *non-interactive* media (Hoffner and Levine, 2005; Goldberg, 1998, 1999; Kirsh, 2012). Scholars distinguished proximate (states) and distal (personality) factors to explain why males seek media violence more than females. Males enjoy the display of violence more (Berry et al., 1999; Hoffner and Levine, 2005; Weaver, 2011) and feel less easily disgusted by portrayals of physical violence (McCauley, 1998). Some studies suggest that males also score higher on trait sensation-seeking and trait aggression (Roberti, 2004) and lower on trait empathy (Rueckert and Naybar, 2008) than females. All three personality traits have been confirmed as predictors of exposure to violence in non-interactive media settings (Hoffner and Levine, 2005).

Do the same factors also explain the gender gap in violent video game use? The display of physical violence in video games differs from the display of physical violence in non-interactive media. Video games are an interactive medium. Users engage in rather than just observe acts of mediated violence. Accordingly, virtual violence can be understood as intentional user action directed to inflict harm on virtual characters. Users may tend to automatically perceive contemporary video game characters as social beings that deserve proper moral treatment (Hartmann et al., 2011). This may explain why studies found that virtual violence is accompanied by neurological and physiological states that are surprisingly similar to the ones accompanying real world violence (Engelhardt et al., 2011; Ravaja et al., 2008; Weber et al., 2006). These characteristics of virtual violence suggest that any explanation of the gender difference in exposure

to video game violence should consider insights gained in non-interactive media settings, but may need to extend these insights by factors specifically linked to the enactment of virtual violence.

Anticipating Enjoyment and Guilt when Engaging in Virtual Violence

In general, exposure to violent video games may be linked to anticipatory affective responses that individuals have when they think about virtual violence. Baumeister and colleagues (2007: 168) argue that anticipatory emotions profoundly influence behaviour: “People learn to anticipate emotional outcomes and behave so as to pursue the emotions they prefer”. Accordingly, those who enjoy certain media content are more likely to use it than those who do not enjoy it (Zillmann, 1988). Individuals that anticipate enjoyment when engaging in virtual violence should be more likely to approach violent video games, and individuals that anticipate regret, shame, guilt, or disgust more likely to avoid them.

Two concrete anticipatory emotions, namely enjoyment and guilt, appear to be particularly important in the context of violent video games (Hartmann, 2012; Jansz, 2005). Males enjoy non-interactive and interactive media violence more than females (Hoffner and Levine, 2005; Lin, 2010). Furthermore, males feel less guilty when engaging in virtual violence than females (Lin, 2010). Accordingly, male users, in general, may anticipate more enjoyment and less guilt from violent video games and, therefore, may play violent games more often than female users. Furthermore, as suggested in previous studies (Hartmann and Vorderer, 2010; Lin, 2010), anticipated enjoyment and guilt may be negatively correlated. The more users anticipate feeling guilty when engaging in virtual violence, the less they may expect to enjoy it.

But what factors may predict stronger anticipatory enjoyment and weaker anticipatory guilt in males as compared to females? The present approach dwells on insights from exposure to violence in non-interactive media settings to answer this question. It focuses on four factors that

(a) have been suggested to explain violent video game use, that (b) vary by gender, and (c) plausibly influence enjoyment and guilt.

Personality Characteristics

Trait empathy. One of the most frequently addressed traits in literature about users' preference for media violence is empathy (Hoffner and Levine, 2005; Tamborini, 2003). Empathy refers to the general capacity to perceive the state of another person (Preston and deWaal, 2002). Less empathetic people engage more frequently in real-world aggression (Cohen and Strayer, 1996). In contrast, empathetic people have a tendency to feel for a victim and suffer more readily if they see that others are hurt (Hoffman, 2000). Some studies suggest that trait empathy is more pronounced among females than males (Rueckert and Naybar, 2008). Empathy may explain why males engage in physical violence more often than females (Carlo et al., 1999). Less empathetic individuals also play violent video games more frequently than others (Anderson et al., 2010; Funk et al., 2004; Lemmens et al., 2006; Sigurdsson et al., 2006). One reason may be that users with lower empathy feel less guilty when engaging in virtual violence (Hartmann et al., 2011; Kobach and Weaver, 2012; Lin, 2010). If males score lower on trait empathy than females, they may anticipate feeling less guilty while engaging in virtual violence than females, and, therefore, may play violent video games more frequently.

Moral justification. People engage in physical violence more easily if they perceive it as morally insignificant. According to Bandura (2002), individuals perceive immoral acts as morally insignificant if they morally disengage. Moral justification has been addressed as a primary moral disengagement mechanism. Moral justification implies that physical violence is perceived as a legitimate and instrumental mean to achieve a higher good (like protecting the community or restoring honour). Males show a stronger tendency to morally disengage than females (Bandura, 2002), and they also tend to morally justify physical violence more (Archer, 2004b; Gabbiadini et

al., 2012; Möller and Krahé, 2009). The tendency to morally disengage predicts enjoyment of and exposure to violent media (Funk et al., 2004; Krakowiak and Tsay, 2011; Sigurdsson et al., 2006), but research on the effect of moral disengagement tendencies on violent video game use is scarce. A study by Tamborini et al. (2013) suggests that users prefer video games that justify virtual violence. In another study by Gabbiadini et al. (2012), moral disengagement tendencies of adolescents were positively correlated with amount and recency of playing *Grand Theft Auto III*, a popular violent video game. A plausible explanation for this finding is that users that tend to justify violence anticipate more enjoyment and less guilt from violent game play. To the extent males morally disengage by justifying violence more than females, they may anticipate more enjoyment and less guilt from violent video game play, and, therefore, use these games more frequently.

Video Game Gratifications. Several scholars (e.g., Lee and LaRose, 2007; Lucas and Sherry, 2004) have shown that video game use can be predicted based on gratifications. Video game gratifications can be understood as desired states that users seek to obtain in video game use. They are based on the general expectation of users that video game use can satisfy their (chronically salient) needs. In the present approach, video game gratifications are reflected by how important users find certain experiential qualities provided by video games. Males may use violent video games more extensively than females, because they find the gratifications provided by these games more important. The two perhaps most frequently addressed predictors of exposure to media violence, sensation seeking and aggression, may be applied to explain this gender difference. Both can be plausibly linked to gratifications or desired states that are provided by virtual violence (Hoffner and Levine, 2005).

Need for sensation in video game play. Sensation-seeking is a dimension of personality that is "defined by the seeking of varied, novel, complex, and intense sensations and experiences"

(Zuckerman, 1994: 27). High sensation seekers prefer high levels of excitement and physiological arousal. Especially during adolescence males score significantly higher on sensation-seeking than females (Zuckerman, 1994). Exposure to media portrayals of physical violence effectively triggers high levels of excitement. Accordingly, sensation-seeking has been consistently found to predict exposure to violence in non-interactive media (Zuckerman, 2006; Krcmar and Greene, 1999; Greene and Krcmar, 2005; Banerjee et al., 2008). A few studies suggest that sensation-seeking determines violent video game use (e.g., Slater et al., 2003). The present approach assumes that the more users seek sensation in general video game play, the more they expect to enjoy virtual violence. Virtual violence typically involves fast-paced action, requires risk-taking, and features the display of immediately arousing material like blood or gore. Again, it may be male users that enjoy and seek these qualities more than female users (Lucas and Sherry, 2004). If males have a stronger need for sensation in video game play, they may expect to enjoy virtual violence more and, therefore, use violent video games more frequently.

Need for aggression in video game play. Trait aggression – an individual's tendency to engage in physical and verbal aggression and to experience anger and hostility (Buss and Perry, 1992) – is another important predictor of exposure to media violence addressed in literature. Men are usually viewed as more aggressive than women and they hold a stronger disposition to engage in physical aggression (Archer and Côté, 2005, Buss and Perry, 1992). More aggressive individuals are more attracted to media violence (e.g., Haridakis, 2002; Hopf et al., 2008; Rosaen et al., 2006; Slater et al., 2003) and also use violent video games more frequently (Colwell and Payne, 2000; Fling et al., 1992; Hartmann and Klimmt, 2006b). The present approach builds on these findings by focusing on aggression as a state that users desire to reach in video game play. Male users may find this gratification more important than female users (Hartmann and Klimmt, 2006a; Jansz, 2005). If users desire to be aggressive in video games, they should anticipate greater

enjoyment, too, because virtual violence promises to satisfy their need. Furthermore, they may expect feeling less guilty, because they may be motivated to justify their virtual violence (Archer, 2004b). Accordingly, to the extent males have a stronger need for aggression in video game play, they may expect greater enjoyment and less guilt from violent video games and, therefore, play these games more frequently than females.

Summary of expectations. In summary, we expect male users to play violent video games more often than female users, because they anticipate greater enjoyment and less guilt from engagement in virtual violence. We expect that anticipated enjoyment and guilt are negatively correlated. We assume that males anticipate greater enjoyment (and, therefore, use violent video games more frequently), because they tend to morally justify physical violence more, and have a greater need for aggression and sensation in video game play than female users. We also expect that male users anticipate feeling less guilty (and, therefore, may use violent video games more frequently), because they may be less empathetic, tend to morally justify physical violence more, and may have a greater need for aggression in video game play than female users.

Method

Design and Sample

To test the proposed assumptions, we conducted an online survey. We promoted participation in the survey via announcements in mailing lists that were sent out to students at two German speaking universities (in Potsdam and Zurich). Originally, N=705 students from these two universities participated in the study. Students recruited in Zurich received credits for participating in the study. Due to technical problems and extensive missing data, N=145 data sets had to be excluded. The remaining sample consisted of N=444 participants (137 female and 307 male), who watched a violent video game trailer that was presented in the survey (*M*age=23.95 years, *SD*=4.28, 86.9% German, 10.6% Swiss, 0.7% other nationality, 1.8% did not specify nationality),

and N=116 (65 female and 51 male), who did not (*M*age=23.83 years, *SD*=3.62). Since the main analyses were concerned with the measures related to the trailer, only the N=444 participants who watched the violent video game trailer were included in the analyses presented below.

Procedure and Stimulus Material

After providing demographic information on sex, age, and nationality, respondents' uses and gratifications of violent video games and sought video game gratifications were assessed, followed by trait measures of moral justification and empathy. Subsequently, the questionnaire presented a trailer (1:44 minutes) of a popular violent video game, *Battlefield: Bad Company 2* (DICE, see http://www.youtube.com/watch?v=f5lnzScc6ZE). In this commercially successful first-person shooter (rated as "superb" by gamespot.com, about 2.3 million units sold in the first two weeks after release, and one of the best-selling games in Germany in 2011 according to biu-online.de, ESRB-rating M; recommended for players aged 18+ in Germany), the player adopts the role of private Preston Marlowe, a soldier of a US special unit. We presented the second of the three "Battlefield Moments" trailers that were released to promote the game. The trailer reveals the actual game play of *Battlefield: Bad Company 2* with original sounds and graphics. It features fast packed action scenes showing Marlowe and his squad fighting in a contemporary modern warfare setting in Chile, and it includes the use of tanks and shells and the shooting of other soldiers.

Prior to the presentation of the violent video game clip, participants were informed about the nature of the content. In line with ethical research standards, respondents were free to watch the trailer of the violent game or to skip it. A comparison of those participants that decided to watch the trailer and those who did not on trait measures, violent video game use, and video game play gratifications showed significant differences on all measures but moral justification; multivariate $F(5,434)=8.65$, $p<.001$. The 116 participants who decided to skip the violent video game trailer were more empathetic; the 444 participants who decided to watch the trailer reported

to play violent video games more often and scored higher on needs for sensation and aggression in video game play.

The participants who watched the clip were asked to report on the feelings of guilt and enjoyment they anticipated from actually playing the game. To counteract any potential negative short-term effects of being exposed to a clip featuring realistically looking violence, a short cheerful video clip of the popular video game Mario Kart (Nintendo) was presented in a final step.

Measures

Violent video game use. Participants were asked to indicate how frequently they played each of the following 11 genres on a five-point scale ranging from (1) never to (5) very often. For each game category a typical and widely known game title was provided as an example. The genres included action adventures, construction strategy, classic adventures, military strategy, genre mix (a combination of shooter and racing games such as *Grand Theft Auto*), beat 'em ups, role playing games, shooters, simulations, sports games, and survival horror games.[2] Three media experts provided content ratings regarding the level of violence typically characteristic of each genre on a five-point scale from (1) nonviolent to (5) very violent. Interrater agreement as indicated by Kendall's *W* was $w=.92$, $p<.01$. On that basis, a mean violence score was calculated across experts for each genre (see also Krahé and Möller, 2010).

To arrive at a measure of the *use of violent video games*, genres that contained some level of violence (expert ratings of higher than "2" on the five-point scale) were selected. This was true for seven genres (all except classic adventures, simulations, sports games, and construction strategy games; violence ratings ranging from 2.67 for action adventures to 5.00 for survival horror games; see Krahé and Möller, 2010). Participants' frequency ratings for each of the selected genres were multiplied by the average violence rating of that genre obtained from the expert raters. The resulting product scores were then averaged across the seven game categories. Using this

multiplicative index can be seen as the standard procedure in media violence research (see Anderson et al., 2008; Busching et al., 2014). Information on reliability, means and standard deviations for all measures are provided in Table 1.

Anticipated guilt and enjoyment. We measured the extent of enjoyment and guilt users anticipated to experience when they would play *Battlefield: Bad Company 2*, which was displayed in a trailer. To assess anticipated guilt, we adapted the five-item state guilt subscale from the State Shame and Guilt Scale by Marshall et al. (1994, e.g., “I would feel remorse, regret”). Responses were made on a five-point scale from (1) not at all to (5) completely. For anticipated enjoyment participants reported on a five-point scale from (1) not at all to (5) completely, how much they imagined playing the video game would be "interesting", "boring" (rev), "enjoyable", and "fun" (Tauer and Harackiewicz, 1999).

Empathy. Nine items from the 16-item Toronto Empathy Questionnaire by Spreng, McKinnon et al. (2009: 68) - a measure that assesses empathy as an "accurate affective insight into the feeling state of another" - were used to assess respondents' trait empathy (e.g., “It upsets me to see someone being treated disrespectfully”). Responses were made on a five-point scale ranging from (1) not at all to (5) completely.

Moral justification of violence. Respondents' general tendency to justify physical violence was assessed by a four-items subscale of the Mechanisms of Moral Disengagement-Questionnaire by Bandura et al. (1996, e.g., “It is alright to fight to protect your friends”). Participants evaluated each item on a five-point scale from (1) not at all to (5) completely.

Video game gratifications: Needs for sensation and aggression. To assess the needs for sensation and aggression in video game play two subscales from the *Video Game Needs Questionnaire* (Möller et al., 2010) were used. Need for sensation was measured by 6 items: While playing a video game it is important to me that a) the game is action-packed; b) the game is

suspenseful and exciting; c) the game provides a certain thrill; d) I can experience risky and dangerous situations in the game; e) I can experience different levels of excitement in a short period of time (e.g., rapid changes of stress and relaxation); f) I can experience rapidly changing emotions (e.g., anxiety, relief, anger, fun, ...) in a short period of time. The subscale to assess the need for aggression in game play consisted of five items: While playing a video game it is important to me that a) I can use the game for venting anger that I have in real life; b) I can act out aggressive fantasies; c) that I can also do things in the game otherwise considered immoral, including aggressive and criminal activities; d) they contain a lot of splatter effects or stunning finishing moves; e) I can use a lot of different innovative weapons. Responses were made on a five-point scale from (1) very unimportant to (5) very important.

Results

The means and standard deviations for all measures, along with information about internal consistency, are presented in Table 1. All measures showed good reliability. The zero-order correlations of all variables are presented in Table 2.

A multivariate ANOVA revealed significant gender differences on all variables (multivariate $F(7, 434)=25.10$, $p<.001$) as expected (see Table 1 for mean differences): Men reported to use violent video games more often than women, and also yielded higher scores on both kinds of video game gratifications, moral justification and anticipated enjoyment. Women scored higher on the trait empathy measure and anticipated more guilt when engaging in virtual violence.

Thus, men and women differed in their use of violent games and all central variables assessed in the present study. In addition, as Table 2 shows, as expected, these variables were significantly associated with the use of violent video games. To examine if the assessed variables mediated the relation between gender and violent video game use ($r=.38$, $p<.001$) as theoretically

expected, a path model was computed using *Mplus* software (Muthén and Muthén, 2007). As illustrated in Figure 1, the model proposed several mediation chains. In line with suggestions by Hayes, Preacher, and Myers (2011) about testing simple mediations and multiple-step mediations, we distinguished between direct paths (e.g., from gender to video game use) and indirect paths running via one or two mediators (e.g., from gender via trait empathy and guilt to video game use).

Model fit was excellent (according to Hu and Bentler, 1999) with $Chi^2 = 2.20$, df = 2, p = .33; CFI = 1.00, TLI = 1.00, RMSEA = .02 (.00-.10), and SRMR = .01. Overall, the model explained 34% of the variance in violent video game use. The examined direct paths are displayed in Figure 1. Of greater interest, however, are the theoretically proposed indirect pathways from gender via other modelled concepts to violent video game use. As expected, gender significantly predicted violent video game use via anticipated enjoyment (*B*=.75, *SE* B=.15, ß=.13, $p<.001$) and guilt (*B*=.31, *SE* B =.10, ß=.05, $p<.01$). This finding suggests that males play violent video games more frequently than females because they anticipate more enjoyment and less guilt. Furthermore, as expected, gender significantly predicted violent video game use via empathy and anticipated guilt, *B*=.05, *SE* B=.02, ß=.01, $p<.05$. This shows that males play violent games more frequently because they anticipate feeling less guilty since they are less empathetic than females. Also in line with expectations, the indirect path from gender to violent video game use running over moral justification and anticipated enjoyment was significant (*B*=.04, *SE* B=.02, ß=.01, $p<.05$), suggesting that males use violent games more frequently because they anticipate greater enjoyment since they have stronger tendency to justify physical violence. However, moral justification did not predict anticipated guilt. Regarding the two video game gratifications, only the expected effect of gender via the need for aggression and subsequently via anticipated enjoyment on violent video game use was significant, *B*=.03, *SE* B=.02, ß=.01, $p<.05$. This finding suggests that males play violent video games more frequently than females because they enjoy virtual

violence more due to their stronger need to be aggressive in video games. However, in contrast to theoretical expectations, neither the observed significant negative influence of users' need for aggression on guilt, nor the observed significant positive influence of users' need for sensation on enjoyment emerged as significant underlying factors of the effect of gender on violent video game use. Over and above the established indirect links, a direct (although weak) effect of gender on violent video game use remained significant.

Discussion

Despite a persistently documented gender gap in the use of violent video games, we know of no empirical study that examined the question *why* males play violent video games more frequently than females. The present study addressed this research gap by examining users' enjoyment and guilt responses to virtual violence, and related traits and video game gratifications, as potentially underlying factors. In doing so, the present approach also answered the call of Hoffner and Levine (2005) for research to probe responses of male and female users to violent media portrayals and measure relevant personal characteristics on which male and female users differ. Results of the present study suggest that males use violent video games more frequently than females, because they expect feeling more enjoyment and less guilt when engaging in virtual violence. The present findings further suggest that male users may expect feeling less guilty, because they are less empathetic than female users. Furthermore, male users seem to anticipate more enjoyment, because they tend to morally justify physical violence more and also maintain a stronger need to act aggressively in video game play.

Generalisability of Findings

Do our observations equally apply to different types of violent video games? We assume that the gender difference that we observed in the present study may be less prominent or non-existing among games that feature barely realistic characters and more artificial displays of the

consequences of physical violence, such as early arcade games like Pac-Man or more recent "funny" games like Angry Birds. However, many contemporary violent video games (including the global bestsellers Grand Theft Auto or the Call of Duty series) feature extremely realistically looking characters that possess sophisticated artificial intelligence, can talk, and display quite complex social cues and emotions. Females may feel less attracted to (and more repelled by) virtual violence enacted against these characters than males. Accordingly, the gender differences that we observed in the present study may particularly apply to contemporary video games that feature more realistically looking characters and physical violence.

Study Implications

These findings have a number of important theoretical implications. Whereas enjoyment has been considered a factor underlying violent video game use (Jansz, 2005), users' guilt responses received less attention in the literature. The present study suggests that, while being negatively correlated, both users' anticipated enjoyment and guilt uniquely affect exposure to violent video games. It may be fruitful to consider the role of other anticipatory emotions in future studies, too. Next to guilt and enjoyment, male and female users' expectations of moral emotions like shame, moral disgust, and pride may be particularly relevant in explaining exposure to violent video games.

The present study confirms the important role of trait empathy in the context of virtual violence. The results suggest that females, because they are more empathetic, anticipate feeling more *guilty* than male users and, consequently, play violent video games less frequently. This finding complements earlier research showing that individuals scoring higher on trait empathy are less likely to seek violence in the media, including violent video games (e.g., Hoffner and Levine, 2005; Sigurdsson et al., 2006; Tamborini, 2003). It also extends previous studies showing that more empathetic users feel more guilt when engaging in virtual violence (Hartmann et al., 2011).

Females seem more susceptible for emotional psychological inference of mental states and feelings of other social characters (Preston and deWaal, 2002). Future studies may examine if this difference implies that female users also tend to anthropomorphize video game characters more (Mar and Macrae, 2006). To the extent they do, female users could be more susceptible to perceive virtual victims as social beings and entities worthy of proper moral treatment (Hartmann, 2012). This may partly explain why (more empathetic) female users expect feeling more guilty when engaging in virtual violence than male users.

The present study also shows that the *enjoyment* users expect from virtual violence (and its subsequent effect on violent video game use) specifically hinges on two factors that are more pronounced among males, namely the tendency to morally justify physical violence on the one hand, and the need to experience aggressive states in video games on the other. These findings correspond well with previous research that showed that individuals with a positive attitude towards physical violence use violent media more often (e.g., Sigurdsson et al., 2006) and that more aggressive individuals are more attracted to media violence and enjoy it more than others (e.g., Haridakis, 2002; Hoffner and Levine, 2005; Weaver, 2011).

The present approach assumed that users that justify physical violence also morally disengage and perceive virtual violence as less morally significant (Funk et al., 2004; Hartmann and Vorderer, 2010; Krakowiak and Tsay, 2011). Accordingly, it was expected that justification of violence would trigger greater anticipatory enjoyment but also lower anticipatory guilt. However, although moral justification was negatively correlated with anticipated guilt in the present study, the mediation model did not yield a significant effect of moral justification on guilt, as one would expect from morally disengaged users. Accordingly, it is tempting to speculate about other explanations why users that tended to justify physical violence also anticipated greater enjoyment. One alternative explanation would be that those who tend to justify physical violence are more

used to retrieving intrinsic rewards from (virtual) violence like feelings of effectance and competence (Jansz, 2005; Przybylski et al., 2009). Accordingly, the tendency to justify physical violence may be closely linked to the experience that virtual violence is an intrinsically rewarding behaviour (Elbert et al., 2010). More fine-grained studies may explore this assumption and illuminate why the tendency of men to justify violence is associated with anticipating greater enjoyment from violent video games.

In addition, the present study shows that males maintain a stronger need for aggression in video game play than females and, therefore, enjoy virtual violence more and, consequently, play violent video games more often. In the present study, need for aggression reflected how important users find it that video games, in general, allow them to behave aggressively. In line with assumptions proposed by Jansz (2005), males find it more important to behave aggressively in video games than females. Violent video games appear most capable to satisfy this need, and male users, therefore, perceive them as more enjoyable.

Unexpected Findings, Unexplained Variance, and Study Limitations

Previous literature suggested that sensation-seeking not only differs by gender, but also predicts preference for violent media (e.g., Zuckerman, 1994). In the present study, *need for sensation*, albeit varying by gender and positively affecting enjoyment and violent video game use, did not emerge as a significant mediator between gender and violent video game use. However, in light of the observed significant correlations of need for sensation with other constructs, it seems plausible to ascribe the unexpected failure of need for sensation to explain the gender gap in violent video game use to methodological rather than theoretical reasons. Detecting significant multi-step mediations demands a lot of statistical power, but the observed simple effects between constructs were comparatively weak in the present study. The same interpretation may explain why the tested path model yielded no significant mediating effect of the "need for aggression on

guilt"-chain, although both concepts differed by gender and were significantly negatively correlated.

The present analysis yielded a considerable *direct* effect of need for sensation on violent video game use, unmediated by enjoyment. This finding suggests that users' need for sensation may affect violent video game use also in ways different from those we conceptualized in the present approach. For example, users with a higher need for sensation may be more inclined to use violent video games, because they expect high levels of suspense. Although closely related to enjoyment, suspense may be considered a unique aspect of users' entertainment experience that was not examined in the present study (Oliver and Bartsch, 2010).

Substantial residual direct effects also remained from gender on guilt, gender on enjoyment, and - although somewhat weaker - from gender on violent video game use. These direct effects suggest that alternative factors underlying the gender gap in violent video game use have not been accounted for in the present model. One potentially relevant factor that was not included may be agreeableness, a trait of the big five basic personality traits associated with friendliness, altruism, and compliance to the needs of others. In a study by Chory and Goodboy (2011), agreeableness negatively predicted frequency of violent video game play. According to Chapman et al. (2006) it has been consistently demonstrated that women score higher on trait agreeableness than men. Similar gender differences and effects on violent video game play have been obtained for another trait, psychoticism (Ravaja et al., 2008). Accordingly, both agreeableness and psychoticism may also explain gender differences in violent video game use.

Gender roles (Zillmann and Weaver, 1996) form another potentially relevant factor that was not included in the present model. Men may consider violent games an attractive platform to enact their gender role and to demonstrate "heroic deeds" and satisfy their need to display competence through competition (Jansz, 2005; Williams et al., 2009). Women, in contrast, may

find violent games incompatible with their gender role to portray empathetic concern and other relational skills.

In addition, another factor not accounted for in the present model has been suggested in a recent experimental study by Kobach and Weaver (2012). They found that pictures that were assumingly showing fictional violence triggered less negative affect in male participants (but not female participants) than the same pictures assumingly showing real violence. Accordingly, fiction may help to make portrayals of violence appealing to male users. Perhaps, violent video games offer sufficient cues for male users to perceive and enjoy virtual violence as "only fictional", whereas female users struggle to distance themselves from the displayed violence (Hartmann, 2012). Follow-up studies should examine these assumptions to further illuminate the gender gap in violent video game use.

Of course, the present findings have to be interpreted within the methodological limitations of the study. The present approach inferred the proposed mediational chains based on cross-sectional data. However, the present distinction of distal and more proximate explanatory factors of violent video game use also partly justified the assumption of a specific order. For example, it was unlikely that proximate factors like anticipated enjoyment or guilt determined a more distal factor like users' trait empathy. Still, future studies would benefit from assessing predictors of violent video game use prior to the actual use.

This limitation aside, the present study is the first to systematically examine factors underlying the gender difference in violent video game use. The study finds that males use violent video game more frequently than females because they expect to enjoy virtual violence more and feel less guilty about it, since they are less empathetic, tend to morally justify physical violence more, and have a stronger need to act out aggressively in video games.

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Footnotes

[1]This definition is derived from a discussion of the term “virtual violence” provided by Hartmann (2011: 34). Maybe most important in this definition is that it defines virtual violence not only based on media content features, but also on psychological features that are only likely to occur if the display of violence is sufficiently realistic. Virtual violence requires that users perceive "pixels on the screen" as social agents and, consequently, intend to do harm to these seemingly social agents. Accordingly, actions directed against more artificially displayed characters like in Space Invaders or Angry Birds may be less likely to qualify as virtual violence.

[2]Assessing the use of video games by a variety of categories were found to be as reliable than using a free nominations approach (asking participants to list their most favourite game titles; see Busching et al., 2014).

Author biography

Tilo Hartmann, PhD, is an associate professor at the Department of Communication Science, VU University Amsterdam. His research focuses on media psychological topics including video games, parasocial interaction, and realism.

Ingrid Möller, PhD, is a Scientific Advisor for social welfare institutions and is associated to the University of Potsdam. Her research focuses mainly on various aspects of child health, including media violence effects.

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Tables and Figures

Table 1

Scale reliabilities, means, and standard deviations (in parentheses) for total sample, men and women

Measure *(Range)*	Items	α	Total *M* (*SD*)	Men *M* (*SD*)	Women *M* (*SD*)	*F* (1,440)	Partial Eta^2
Use of violent video games (1-25)[a]	7	.63	7.76 (2.73)	8.45 (2.57)	6.19 (2.44)	74.43***	.15
(Anticipated) enjoyment (1-5)	4	.90	3.24 (1.18)	3.61 (.99)	2.40 (1.13)	128.59***	.23
(Anticipated) guilt (1-5)	5	.92	1.69 (1.00)	1.43 (.72)	2.27 (1.27)	76.90***	.15
Trait empathy (1-5)	9	.79	3.90 (.58)	3.80 (.58)	4.11 (.54)	26.51***	.06
Moral justification (1-5)	4	.61	2.18 (.65)	2.26 (.64)	2.00 (.64)	15.52***	.03
Need for sensation in video games (1-5)	6	.76	2.89 (.73)	2.98 (.69)	2.69 (.80)	14.84***	.03
Need for aggression in video games (1-5)	5	.74	1.91 (.78)	1.99 (.75)	1.72 (.83)	10.79**	.02

[a] Multiplicative index of frequency and violence ratings.
*p<.05; **p<.01; ***p<.001.

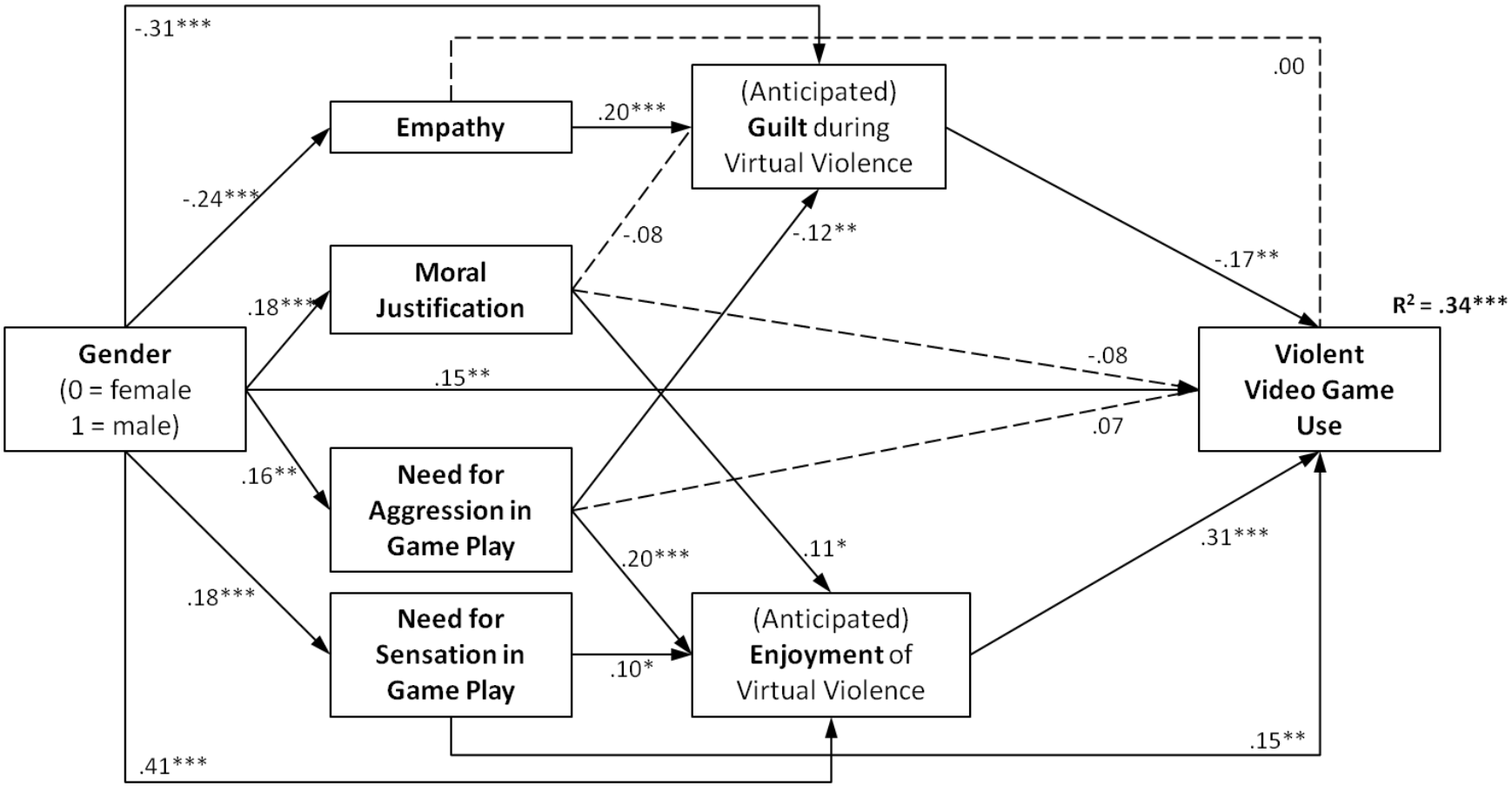
Table 2

Zero-order correlations for total sample (N = 444)

	1	2	3	4	5	6	7
1 Use of violent video games	-	.52***	-.42***	-.14**	.12*	.32***	.29***
2 Anticipated enjoyment		-	-.55***	-.17***	.26***	.31***	.34***
3 Anticipated guilt			-	.32***	-.20***	-.18***	-.23***
4 Trait empathy				-	-.14**	.00	-.20***
5 Moral justification					-	.23***	.29***
6 Need for sensation in video games						-	.52***
7 Need for aggression in video games							-

*p<.05; **p<.01; ***p<.001.

Figure 1. *Path model of factors illuminating the gender gap in violent video game use*



Note. Displayed are standardized path coefficients. Dashed lines indicate non-significant paths. Anticipated guilt and enjoyment were correlated r = -.41***. Traits and needs were inter correlated according to model specifications; correlation coefficients were as follows: Empathy with moral justification: -.10*; with need for aggression: -.17***; with need for sensation: .05. Moral Justification with need for aggression: .27***; with need for sensation: .20***. Need for Aggression with need for sensation: .50***. *p<.05; **p<.01; ***p<.001.